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REPORT DOCUMENTATION PAGE 2. GOVT ACCESSION N	READ INSTRUCTIONS
Z. GOVT ACCESSION N	BEFORE COMPLETING FORM G. 3. RECIPIENT'S CATALOG NUMBER
DR-1884	O. S. RECIFICAT S CATALOG ROMBER
TITLE (and Subfille)	5. TYPE OF REPORT & PERIOD COVERED
19304D GSRS	
Missile Number 1023	
Round Number Y-23.	6. PERFORMING ORG. REPORT NUMBER
. Au Thomas	CONTRACT OR GRANT NUMBER(*)
WSMR Meteorological Tour	116657 2D126462
PERFORMING ORGANIZATION NAME AND ADDRESS	10 PERSONAL FLANENT PROJECT TASK
PERFORMING UNDANIZATION WANTE AND THE PERFORMING	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
1. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE
US Army Electronics Research & Development Comd (
Atmospheric Sciences Laboratory	A 12 HUMBER OF BAGES
White Sands Missile Range, New Mexico	LIE SECURITY CLASS (ALC.)
) 15. SECURITY CLASS. (of this report)
US Army Electronics Research & Development Comd	UNCLASSIFIED
(12) 1.60	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
18. SUPPLEMENTARY NOTES	
9. KEY WORDS (Continue on reverse side if necessary and identify by block numb	or)
1. Ballistics	
2. Meteorology	
2. Meteorology 3. Wind	
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INTRODUCTION

19304D GSRS , Missile Number 1023 , Round Number V-23 , was launched from <u>LC-33</u>, White Sands Missile Range (WSMR), New Mexico, at <u>1517</u> MST, 24 April 1979 . The scheduled launch time was 1515 MST.

DISCUSSION

Meteorological data were recorded and reduced by the White Sands Meteorological Team, Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods:

- 1. Observations
 - a. Surface
- (1) Standard surface observations to include pressure, temperature (°C), relative humidity, dew point (°C), density (gm/m^3) , wind direction and speed, and cloud cover were made at the <u>LC-33</u> Met Site at T-0 minutes.
- (2) Anemometer data were provided from existing pole-mounted and tower-mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room.
 - b. Upper Air
- (1) Low level wind data were obtained from RAPTS T-9 pibal observation at:

SITE AND ALTITUDE

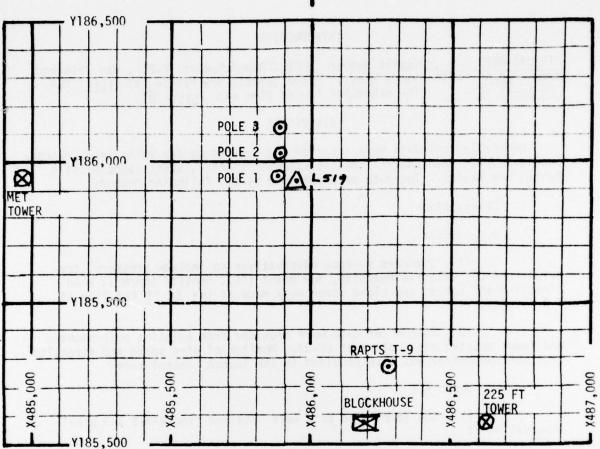
LC-33 1 kilometer (50-meter increments)

(2) Air structure data (rawinsonde) were collected at the following Met Sites. Data were collected from surface to 53.500 feet in 500-feet increments.

SITE AND TIME

SMR 1530 MST





- MET TOWER 4 Bendix Model T-120 Anemometers at 12 ft, 62 ft, 102 ft and 202 ft with E/A recorders.
- 2. POLE ANEMOMETER Bendix Model T-120 with E/A recorders.
 - (a) Pole #1 38.7 ft
 - (b) Pole #2 53.0 ft
 - (c) Pole #3 83.6 ft
- 3. 225 FT WIND TOWER 5 Bendix Model T-120 Anemometers at 35 ft, 88 ft, 128 ft, 168 ft and 200 ft with 5 X-Y visual indicators in Blockhouse.
- 4. RAPTS T-9 Radar Automatic Pilot-Balloon Tracking System T-9 Radar

The data are presented in the following tabulations:

ELEVATION	3977.30	FT/MSL
PRESSURE	893.9	MBS
TEMPERATURE	28.6	°C
RELATIVE HUMIDITY	26	%
DEW POINT	7.1	°C
DENSITY	1003	GM/M ³
WIND SPEED	10	MPH
WIND DIRECTION	270	DEGREES
CLOUD COYER	3	Cs

TABLE I. SURFACE OBSERVATIONS TAKEN AT 1520 LOCAL TIME, 24 APRIL 1979 AT LC-33, 19304D GSRS, MISSILE NO. 1023, ROUND NO. V-23.

LC-33 FIXED POLE AMEMOMETER MEASURED WINDS

	POLE #1			POLE #2			POLE #3	3
T-TIME SEC	DIR	SPEED	T-TIME SEC	DIR	SPEED	T-TIME SEC	DIP	SPEED
-3 0	265	17	-30	282	16	-30 .	257	18
-20	267	19	-20	282	17	-20	261	25
-10	267	19	-10	284	15	-10	258	25
0.0	272	20	0.0	289	14	0.0	270	27
+10	273	18	+10	291	13	+10	273	28

POLE	#1	=	X485,874.29	Y185,958.90	H4018.74	38.7	ft.	VLF
POLE	#2	=	X485.874.93	Y186,012,00	H4033.57	53.0	ft	ACI

POLE #3 = X485,877.29 Y186,116.06 H4063.92 83.6 ft. AGL

TYBLE TI	-				
TYPE	04D GSRS	MISSILE MO.	1023	פון מוויוסם	. V-23
LAUNCHED FR	OM LC-33	DATE	24 April 19	779 TIME	1517 LST
NOTE: WINE	DIRECTIONS	ARE REFERENCED	TO THE FIPI	no AZIMUTH	
OR TRUE HOP	THE TRUE NO	RTH .			

LC-33 METEOROLOGICAL TOWER ANEMOMETER MEASURED WINDS (202 FT TOWER)

l	EVEL #1 12 ft		0.113	LEVEL #2 62 ft	
T-TIME SEC	DIR DEG	SPEED MPH	T-TIME SEC	DIR DEG	SPEED MPH
-30	268	17	-30	259	18
-20	273	18	-20	270	16
-10	280	15	-10	273	17
0.0	280	16	0.0	259	14
+10	288	13	+10	264	10
ı	EVEL #3 102 ft			LEVEL #4 202 ft	
Y-TIME SEC	DIR DEG	SPEED MPH	T-TIME SEC	DIR DEG	SPEED MPH
-30	274	22	-30	257	21
-20	285	23	-20	270	22
-10	280	18	-10	273	20
0.0	283	17	0.0	261	17
+10	267	17	+10	270	17

WTSM COORDINATES: X484, 382.64 Y185,957.73 H3983.00 (base)

TABLE III					
TYPE 19304D GSRS	MISSILE NO.	1023	ROUND I	NO. V-23	
LAUNCHED FROM LC-33	DATE 24 Apr	11 1979	TIME	1517	MST
NOTE: WIND DIRECTIONS ARE	REFERENCED TO	THE FIRING	AZIMU	тн	
OR TRUE NORTH TRUE NORTH	<u>.</u> . ,		*	• .	

PILOT BALLOON MEASURED WIND DATA

HEIGHT METERS	DIR DEG	SPEED MPH
SUR	270	10.0
50	270	12.0
100	269	14.8
150	267	22.1
200	272	27.5
250	270	29.3
300	265	30.6
350	266	30.9
400	266	23.6
450	262	21.3
500	263	23.7

HEIGHT METERS	DIR	SPEED MPH
550	270	25.8
600	271	26.9
650	270	30.5
700	271	30.0
750	270	27.5
800	269	30.5
850	277	25.7
900	270	24.6
950	269	24.2
1000	281	26.5
1050	<u> </u>	

TABLE IV							
RELEASED FROM	LC-33	DATE	24 Ar	ril 1979	TIME	1516	LST
RELEASE POINT	COORDINATES	(WSTM)	X = 48	86,037.24	Y = 182,35	0.16 H	= 3977.30
MISSILE TYPE	19304D GSRS	N	MISSILE	NO. 1023	ROUNT	NO. V-	-23
MISSILE LAUNCH	IED FROM LO	-33	DATE	24 April	1979	TIME 15	517 LST
NOTE: WIND DI	RECTIONS ARE	REFERE	NCED TO	THE FIRE	NG AZIMUTH		
OR TRUE NORTH	TRUE NORTH						

STATION ALIITUDE 3997.30 FEET MSL 24 APR. 79 ASCENSION NO. 73

SIGNIFICANT LEVEL DATA 1140060073 SMR

GEODETIC COORDINATES 32.48034 LAT DEG 106.42307 LON DEG

PRESSURE	GEUMETRIC	TEMPERATUR ATR DEMPO	A 12	REL.HUM
MILLIBARS	MSL FEE	EES CENT		
72.	.766	0	7.1	
53.	311.	7.6	•	
20.	767.	5.4		
30.	.0Ct	- +	0.	6
70.	543.	7.0		6
.00	0202.	0.3 -1	1.9	:
59.	1837.	·- 0.		
.90	+036.	1.9 -1		:
81.	5145.	.5 -1	2.0	.0
54.	1757.	5-8		
.00	9012.	2- 0.0	2.9	5
456.0	21342.2	6.0 -3	0.0	27.0
20.	3310.	19.7 -3	1.0	5
.00	4530.	22.8 -3	•	o.
. 19	6571.	28.6 -3	•	8
45.	8234.	32.6 -4	•	7
.00	1221.	6-00		0
50.	5214.	51.		
.00	.6686	59		
92	1408.	63		
	. 070	. 7		
50.	077	-64.7		
41.	. 4060	000		
30.	34,33.	10		
23.	3605.	01		
16.	1752.	63.		
.90	2513.	61.		
03.	3275.	•		
00	3918.	61.		

7

GEODETIC COOKDINATES	32.48034 LAT DEG	106.42307 LON DEG
UPPER AIR UATA	SXR	
STATION ALTITUDE 3997.30 FEET MSL	24 APR. 79 1530 HRS MST	ASCENSION NO. 73

INDEX OF REFRACTION	.00024	.00024	.0002	.00004	.00024	.00023	.90023	.00022	.00022	.00021	.00001	.0000.	.00025	.000020	.000020	.000020	.00019	1.000194	.00019	.00018	.00018	.00018	.00017	.00017	.000017	.00016	.00016	.00016	.00015	.00015	.00015	.00015	.00014	.00014	.00014	.00014	.00013	.00013	.00013	.00013
ATA SPEED KNOTS	5	5	8	1:	. +	7.	. 9	3	0	0	7.	9	5	t	5	5	5	16.2	9	8	6	-	t	6,	9	0	9	7	8	6	0	-	3	9	7	6	3	8	7	S
WIND DA DIRECTION DEGREES(TW)	80.	50.	270.8	14.	73.	71.	70.	.60	.19	65.	03.	.09	57.	55.	53.	51.	64		40.	48	47.	48.	40.	50.	50.	.09	52.	54.	54.	01.	. 49	07.	70.	73.	73.	76.	77.	78.	270.2	74.
SPEED OF SOUND ANOTS	77.	77.	670.5	73.		.69	57.	.09	.+0	. 70	.19	.69	57.	55.	54.	25.	50.	646.5	0	45.	40,0	77	41.	41.	40.	34.	35.	37.	30.	35.	33.	32.	30.	59.	27.	25.	24.	52	24.	7
DENSITY S GM/CUBIC WETER	. 100	•	66	.0	-	0	947.8	0	;	·	:	6	ė	0	0		+	823.3		.0	6	0	+		9	0	5	0		:	:	:	·	3	2	10	10	10	5	
REL.HUM. PERCENT	0	0	7.	8	c.	6	6	6	0	0	6	0		0		3	5	27.3	9	0	0	0	n	0	5	0	· N		0	0	·	t	3	5	.0		7	0.	0	ė
ERATURE DEWPOINT CENTIGRADE			0						.0		-8.6	0	.0	:	12.	·	3	-13.5	+	15.	15.	10.	17.	0	20.	21.	22.	24.	25.	26.	9		27.	28.	23.	0	30.	31.	31.	•
TEMP AIR DEGREES			20.7											6.6	8.3	6.7	5.1	3.6	2.5	0.	5.5	-1.8	7.7-	-2.4	-3.1	-3.9	7.4-	-5.5	-6.3	+· L-	-8-7	-10.0	-11.3	V	3	0	0	17	-18.2	5
PRESSURE MILLIBARS	72.	72.	57.	43.	28.	14.	.66	85.	72.	56.	* + +	31.	16.	05.	92.	19.	.19	654.8	42	30.	18.	07.	35.	. +8	73.	62.	51.	.04	30.	20.	10.	.00	.06	80.	71.	01.	52.	43.	34.	50.
SEOMETRIC ALTITUDE MSL FEET	.155	.000	500.	.000	.003	.000	500.	.000	.009	.000	.005	.000	.009	.0000	0500.	10001	1500.	12000.0	2500.	3000.	3500.	+000h	4500.	50000	5500.	.0000	65500	70007	7500.	.00009	3500.	.0006	9500.	.0000	0200	10001	1500.	-00007	2500.	3000

STATION ALKITUDE 3997.30 FEET MSL 24 APR. 79 ASCENSION NO. 73

UPPER AIR DATA 1140060073 5 M R

GEODETIC COOMDINATES 32.48034 LAT DEG 106.42307 LON DEG

INDEX OF REFRACTION	1.000131	10000	1.000123	1.000125	1.000123	1.000121	1.000119	1.000117	1.000115	1.000112	1.000110	1.000108	1.000107	1.000105	1.000103	1.000101	1.000100	1.000098	1.000096	1.000094	1.000093	1.000001	1.000090	1.000088	1.000036	1.000085	1.000063	1.000081	1.000080	1.000078	1.000077	-	1.000074		-	1.0		-	1.000065	1
SPEED KNOTS	0.04	2 4 5	T	1 0	50.7	50.7	49.7	48.8	48.2	48.2	48.7	8.64	51.4	54.1	26.9	57.9	58.6	0.09	61.5	63.2	64.8	0.99	67.3	68.6	72.2	16.6	81.4	86.3	91.0	65.7	9.66	103.4	104.5	104.7	104.3	103.1	103.9	105.7	110.0	112.1
DIRECTION SOCGREES(TN) K	2.070	0.070	274.1	27.3.9	273.1	274.2	270.2	279.7	265.6	3.682	209.4	269.3	269.2	290.5	291.3	290.5	289.8	233.7	253.8	290.3	291.8	293.6	6.462	562.6	297.2	298.5	56662	301.1	301.8	302.4	302.5	302.6	303.1	303.8	304.3	204.7	303.7	302.1	300.5	4.662
SOUND NNOTS	16) (3 6		9													589.4																					565.0
6W/CUBIC NETER	874.8	2000	0.000	2000	0.000	532.6	524.0	515.6	507.2	0.650	491.0	483.1	475.4	467.9	460.4	453.1	445.7	438.1	430.0	423.3	410.1	400.1	432.2	395.4	398.2	330.6	375.6	355.9	358.8	351.6	340.0	334.3	331.7	325.3	319.3	313.3	307.4	300.5	293.2	280.3
PERCENT	4	0.00	0.00	33.60	58.0	55.7	67.3	0.09	50.7	41.4	36.9	36.7	36.5	36.4	36.2	36.1	33.5**	**0.63	24.5**	20.0**	15.5**	10.0**	****	1.0**																
NT	U	100	-30.5	-30.6	-31.3	-31.9	-32.5	-34.9	-37.7	7.04-	0.64-	F. 44-	-45.6	6.94-	-48.5	5.04-	-51.5	-53.7	-56.5	-56.0	-62.0	-65.7	4.07-	-79.5																
AIR DEWPO.	-200.2	100	-22.7	124.1	-25.5	-27.0	-26.4	-29.6	-30.8	-32.0	-33.3	-34.7	-36.1	-37.5	-38.9	-40.3	-41.6	-42.9	-44.2	-45.5	-46.8	-40.1	1.61-	-50.7	-51.8	-52.7	-53.6	-54.5	-55.4	-56.4	-57.3	-59.5	1-69-	0.09-	-61.3	-62.5	-63.6	-63.8	-64.1	-54.3
MILLIBARS							365.3					330.7																			213.8	208.8				-	-	130.4	176.6	171.7
SEOMETRIC ALTITUDE MSL FEET	74500.0	0000	24500.0	25000.0	0.00002	20000-0	26530.0	27000.0	27500.0	28000.0	26506.0	29000.0	69500.0	300000	30500.0	0.00010	31500.0	32000.0	52500.0	33000.0	33500.0	24000.0	24500.0	35000.0	35500.0	300000	30500.0	0.000/0	0.00576	200000	30500.0	39000.0	39500.0	4000000	40500.0	41000.0	41500.0	45000.0	42500·C	43000.0

AT LLAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

NNA	TATION AL		3997.30 FEET MS 1530 ARS MST	MSL 4ST	_	UPPER AIR UAT 1140050075 5 M R	7.5 TA		32.46 32.46	DETIC COOKDINATES 32.46034 LAT DEG 106.42307 LON DEG
o a z	GEUMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMP AIR UEGREES	PERATURE DEWPOINT CENTIGHADE	REL.HUM. PERCENT	DENSITY GWZCUBIC METER	SPEED OF SOUND AMOTS	DIRECTION SP DESREES(TW) KN	SPEED KNOTS	INDEX OF REFRACTION
	43500.0		5.49-			279.6	564.7	299.4	109.5	1.000062
	0.0000++	163.4	9.49-			272.9		299.6	105.0	1.000061
	0.00544	159.	1.49-			265.6		300.4	9.46	1.000059
	45000.0	155.	-63.9			258.9		301.4	94.4	1.000058
	45500.0	151.	2.49-			2555.		301.6	76.1	1.000056
	0.00000	147.	-65.2			247.8		301.6	67.8	1.000055
	46500.0	144.	0.99-			242.7	550.7	300.3	65.3	1.000054
	47000.0	140.	9.99-			237.4	4,	298.6	65.6	1.000053
	47500.0	137.	-66.3			231.1		297.0	60.5	1.000051
	+90000+	133.9	-62.9			225.0		295.4	58.2	1.000050
	48200.0	150.6	-65.6			219.1		292.9	9.49	1.000049
	49030.0	127.4	-64.3			212.5		0.067	50.9	1.000047
	49500.0	124.2	-63.1			200.0		285.2	49.8	1.000046
	0.00000		-63.1			201.1		230.3	1.61	1.000045
	20200.0		-63.6			196.6		278.7	52.4	1.000044
	51000.0		-63.4			191.7		277.4	55.3	1.000043
	51590.0		-62.7			180.3		278.9	58.3	1.000041
^	52090.0	109.9	-61.9			181.2		280.3	61.3	1.000040
	52500.0		-61.2			176.2				1.000039
	53000.0	104.	-61.6			174.5				1.000038
	53500.0	102.	-62.0			160.4	566.2			1.000037

STATION ALTITUDE 3997.30 FEET MSL 1140060073 1140060073 ASCENSION NO. 73

GEODETIC COORDINATES 32-48034 LAT DEG 106-42307 LON DEG

GEOPOTENTIAL		ONIM	WIND DATA			EMPERATUR	ul
ALTITUDE DECAMETERS	DIRECTION DEG (TR)	SPCED	S S S	RP. ≈ 2	DEW PT DEP AIR PRESSURE DEG C DEG C MILLIBARS	AIR DEG C	PRESSURE MILLIBARS
1630.	***6666	*** 56666	***5556- ***6666- ***5666	***5556-	66	-61.7	-61.7 1.000+2

** WIND DATA NOT COMPUTED DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.

MANDATORY LEVELS 1140060075 S.M.R.

STATION ALTITUDE 3997.30 FEET MSL 24 APR. 79 1530 HRS MST ASCENSION WO. 73

GEODETIC COORDINATES 32.46034 LAT DEG 106.42307 LON GEG

PRESSURE 6	PRESSURE GEOPOTENTIAL	15.4	TE WPERATURE	REL . HUM.		A
MILLIBARS	FEET	DESREES C	CENTIGRADE	PERCENT	DIRECTION DEGREES(TN)	SPEED KN01S
0.058	4764.	25.4	9:	15.		19.9
800.0	• 2649	20.5	-4.1	19.		20.4
750.0	3298.	14.3	-8.5	20.		18.2
700.0	10194.	6.6	-11.9	21.		15.0
6.039	12183.	3.0	0) · K) · I	:00:		10.5
0.009	14286.	-2.0	-17.3	30.		23.3
550.n	16546.	8.4-	-23.1	. 72		26.9
50000	18986.	-10.0	-26.8	25.		31.4
450.0	21617.	-16.6	-30.8	20.		45.0
0.004	54490.	-22.8	-30.5	49.		46.5
350.0	27640.	-31.3	-38.8	47.	287.9	48.1
300.0	31160.	6.04-	-50.1	36.		58.2
250.0	35130.	-51.3				69.5
200.0	39804.	-59.8			_	104.7
175.0	42506.	-64.1			-	110.8
150.0	45594.	2.49-				72.8
125.0	49230.	-63.4				50.1

AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION. -16.6 -22.8 -31.3 -51.3 -59.8 -64.1 -64.7 21617 27640 321160 331160 42504 49230 53750 450.0 350.0 350.0 300.0 2550.0 175.0 100.0 **

WRIT MAIDATORY LEVELS	1140060975	SMR	
	STATION ALIITUDE 3997.30 FEET MSL	24 APR. 79 1530 HRS MST	ASCENSION 1.3. 73

GEODETIC COORDINATES 32.46034 LAT DEG 106.42307 LON DEG

PRESSURE MILLIBARS		04050	1.500+2	1.750+2	2.000+2	2.500+2	3.000+2	3.500+2	4.000+2	4.500+2	5.000+2	5.500+2	6.000+2	6.500+2	2+000-7	7.500+2	8.000+2	8.500+2
TEMPERATURE AIR DEG C	-61.27	-63-4	-64.7	-64.1	-59.8	-51.3	6.04-	-31.3	-22.8	-10.6	-10.0	8.4-	-2.0	3.0	9.3	14.8	20.2	25.4
DEW PT DEP DEG C	50	55	66	66	55	66	60	000	0.00	1.4	16	10	15	17	21	23	24	20
3 0 1 d ul Z	i																	
DATA N-S MPS	*** 60000-	-7-	-50.	-29.	-30.	-16.	-10.	.3-	-5-		:	;	· •	;	2.	:	-0-	;
SPEED																		
DIRECTION UEG (TH)	****6666	287.	302.	200.	304.	596.	.067	.882	274.	278.	268.	253.	249.	.642	255.	.402	271.	276.
GEOPOTENT AL ALTITUDE DECAMETENS	1636	1501.	1390.	1296.	1213.	1071.	.056	843.	746.	.659	579.	.+05	436.	371.	311.	253.	196.	145.

** WIND DATA NOT COMPUTED DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.